

**WEST**☐ Generate Collection

L2: Entry 5 of 64

File: USPT

Jan 30, 2001

US-PAT-NO: 6180112

DOCUMENT-IDENTIFIER: US 6180112 B1

TITLE: Pasteurella haemolytica vaccine

DATE-ISSUED: January 30, 2001

## INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Highlander; Sarah K.	Houston	TX		
Fedorova; Natalie D.	Houston	TX		

## ASSIGNEE-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY	TYPE CODE
Balyor College of Medicine	Houston	TX			02

APPL-NO: 9/ 298367

DATE FILED: April 22, 1999

## PARENT-CASE:

This is a continuation of application(s) Ser. No. 08/834,455 filed on Apr. 15, 1997, now abandoned.

INT-CL: [7] A61K 39/102

US-CL-ISSUED: 424/255.1; 424/234.1, 424/236.1, 424/235.1, 424/200.1, 435/69.1, 435/172.1, 435/252.3, 536/23.7, 536/24.1

US-CL-CURRENT: 424/255.1; 424/200.1, 424/234.1, 424/235.1, 424/236.1, 435/252.3, 435/69.1, 536/23.7, 536/24.1

FIELD-OF-SEARCH: 424/234.1, 424/255.1, 424/257.1, 424/236.1, 424/200.1, 424/235.1, 536/23.7, 536/24.1, 435/320.1, 435/69.1, 435/243, 435/252.3, 435/69.3, 435/71.1, 435/172.1, 435/172.3, 530/350

PRIOR-ART-DISCLOSED:

U.S. PATENT DOCUMENTS

Search Selected

Search ALL

PAT-NO	ISSUE-DATE	PATENTEE-NAME	US-CL
<input type="checkbox"/> 3328352	June 1967	Kwolek	N/A
<input type="checkbox"/> 4167560	September 1979	Wohler, Jr.	424/92
<input type="checkbox"/> 4171354	October 1979	Smith	424/92
<input type="checkbox"/> 4328210	May 1982	Kucera	424/92
<input type="checkbox"/> 4336074	June 1982	Dinkelacker	134/8
<input type="checkbox"/> 4683195	July 1987	Mullis et al.	435/6
<input type="checkbox"/> 4683202	July 1987	Mullis	435/91
<input type="checkbox"/> 4955317	September 1990	Kinoshita et al.	118/689
<input type="checkbox"/> 4957739	September 1990	Berget et al.	424/92
<input type="checkbox"/> 5028423	July 1991	Prickett	424/85.8
<input type="checkbox"/> 5055400	October 1991	Lo et al.	435/69.1
<input type="checkbox"/> 5336491	August 1994	Berget et al.	424/190.1
<input type="checkbox"/> 5476657	December 1995	Potter	424/184.1

## FOREIGN PATENT DOCUMENTS

FOREIGN-PAT-NO	PUBN-DATE	COUNTRY	US-CL
91/06653	May 1991	WOX	

## OTHER PUBLICATIONS

Cruz et al. Molec. Microbiol. 1990. 4(11): 1933-1939, 1990.

Nicaud et al. Febs Letters. 1985. 187(2): 339-344, 1985.

"United States Pharmacopeia," vol. XXII (1990, United States Pharmacopeial Convention, Rockville, MD, p. 151.

Anderson and Young, "Quantitative Filter Hybridisation," in Nucleic Acid Hybridisation (1985).

Azad et al., "Construction of conjugative shuttle and suicide vectors for *Pasteurella haemolytica* and *P. multocida*," Gene 145:81-85 (1994).

Azad et al., "Distinct plasmid profiles of *Pasteurella haemolytica* serotypes and the characterization and amplification in *Escherichia coli* ampicillin-resistance plasmids encoding ROB-1 .beta.-lactamase," J. Gen. Microbiol. 138:1185-1196 (1994).

Blood, Pocket Companion to Veterinary Medicine, Bailliere Tindall, London, pp. 309-310 (1994).

Briggs et al., "Characterization of a Restriction Endonuclease, *PhaI*, from *Pasteurella haemolytica* Serotype A1 and Protection of Heterologous DNA by a Cloned *PhaI* methyltransferase Gene," App. Environ. Microbiol. 60:2006-2010 (1994).

Chang et al., "Characterization of plasmids with antimicrobial resistant genes in *Pasteurella haemolytica* A1," J. DNA Seq. Map. 3:89-97 (1992).

Chang et al., "Identification and Characterization of the *Pasteurella haemolytica* Leukotoxin," Infect. Immun. 55:2348-2354 (1987).

Clewell et al., "Unconstrained bacterial promiscuity: the Tn916-Tn1545 family of conjugative transposons," Trends Microbiol. 3:229-236 (1995).

Clinkenbeard et al., "Transmembrane Pore Size and Role of Cell Swelling in Cytotoxicity Caused by *Pasteurella haemolytica* Leukotoxin," Infect. Immun. 57:420-425 (1989).

Confer et al., "Bovine pneumonic pasteurellosis: Immunity to *Pasteurella haemolytica*," J. Amer. Vet. Med. Assoc. 193:1308-1316 (1988).

Confer et al., "Molecular Aspects of Virulence of *Pasteurella haemolytica*," Can. J. Vet. Res. 54:S48-S52 (1990).

Coombs, Dictionary of Biotechnology, Stockton Press, New York NY (1994).

Craig et al., "A Plasmid Which Can Be Transferred Between *Escherichia coli* and *Pasturella haemolytica* by electroporation and Conjugation," *J. Gen. Microbiol.* 135:2885-2890 (1989).

Dieffenbach and Dveksler, *PCR Primer, a Laboratory Manual*, Cold Spring Harbor Press, Plainview NY (1995).

Diker et al., "Antimicrobial susceptibility of *Pasturella haemolytica* and *Pasturella multocida* isolated from pneumonic ovine lungs," *Vet. Rec.* 134:597-598 (1994).

Dixon et al., "An Analysis of the Complete Nucleotide Sequence of the *Haemophilus ducreyi* Broad-Host-Range Plasmid pLS88," *Plasmid* 32:228-232 (1994).

Donachie et al., "Comparison of Cell Surface Antigen Extracts from Two Serotypes of *Pasturella haemolytica*," *J. Gen. Microbiol.* 130:1209-1216 (1984).

Dower et al., "High Efficiency Transformation of *E. coli* by high voltage electroporation," *Nucl. Acids Res.* 16:6127-6145 (1988).

FDA Guidelines for Parenteral Drugs (Dec. 1987).

Fleischmann et al., "Whole-Genome Random Sequencing and Assembly of *Haemophilus influenzae* Rd," *Science* 269:496-512 (1995).

Forestier and Welch, "Nonreciprocal Complementation of the *hlyC* and *lktC* Genes of the *Escherichia coli* Hemolysin and *Pasturella haemolytica* Leukotoxin Determinants," *Infect. Immun.* 58:828-832 (1990).

Frank, "Pasteurellosis of Cattle," *Pasteurella and Pasteurellosis*, C. Adlam and J. Rutters (eds.), Academic Press, San Diego, CA, pp. 197-222 (1989).

Frey, "Construction of a broad host range shuttle vector for gene cloning and expression in *Actinobacillus pleuropneumoniae* and other Pasteurellaceae," *Res. Microbiol.* 143:263-269 (1992).

Frey et al., "Identification of a Second Hemolysin (HlyII) in *Actinobacillus pleuropneumonia* Serotype 1 and Expression of the Gene in *Escherichia coli*," *Infect Immun.* 60:1671-1676 (1992).

Gay et al., "Positive Selection Procedure for Entrapment of Insertion Sequence Elements in Gram-Negative Bacteria," *J. Bacteriol.* 164:918-921 (1985).

Gentry et al., "Serum Neutralization of Cytotoxin from *Pasturella Haemolytica* Serotype 1 and Resistance to Experimental Bovine Pneumonic Pasteurellosis," *Vet. Immunol., Immunopathol.* 9:239-250 (1985).

Gentry and Srikumaran, "Neutralizing monoclonal antibodies to *Pasturella haemolytica* leukotoxin affinity-purify the toxin from crude culture supernatants," *Microbial Pathogen.* 10:411-417 (1991).

Gu et al., "Independent Control of Immunoglobulin Switch Recombination at Individual Switch Regions Evidenced through Cre-loxP-Mediated Gene Targeting," *Cell* 73:1155-1164 (1993).

Guttererson and Koshland, "Replacement and amplification of bacterial genes with sequences altered in vitro," *Proc. Natl. Acad. Sci. USA* 80:4894-4988 (1983).

Haynes, *Keeping Livestock healthy*, Garden Way Publishing, Charlotte, VA, pp. 145-148, (1978).

Highlander and Garza, "The restriction-modification system of *Pasturella haemolytica* is a member of a new family of type I enzymes," *Gene* 178:89-96 (1996).

Highlander and Weinstock, "Static DNA Bending and Protein Interactions Within the *Pasturella haemolytica* Leukotoxin Promoter Region: Development of an Activation Model for Leukotoxin Transcriptional Control," *DNA Cell Biol.* 13:171-181 (1994).

Highlander et al., "DNA Sequence of the *Pasturella haemolytica* Leukotoxin Gene Cluster," *DNA Cell Biol.*, 8:15-28 (1989).

Highlander et al., "Expression of the *Pasturella haemolytica* Leukotoxin Is Inhibited by a Locus That Encodes an ATP-Binding Cassette Homolog," *Infect. Immun.* 61:3942-3951 (1993).

Highlander et al., "Secretion and Expression of the *Pasturella haemolytica* Leukotoxin," *J. Bacteriol.* 172: 2343-2350 (1990).

Homchampa et al., "Construction and vaccine potential of an *aroA* mutant of *Pasturella haemolytica*," *Vet. Microbiol.* 42:35-44 (1994).

Issartel et al., "Activation of *Escherichia coli* prohaemolysin to the mature toxin by acyl carrier protein-dependent fatty acylation," *Nature* 351:759-761 (1991).

Keilty and Rosenberg, "Constitutive Function of a Positively Regulated Promoter Reveals New Sequences Essential for Activity," *J. Biol. Chem.* 262:6389-6395 (1987).

- Kumar et al., "The Minus 35-Recognition Region of *Escherichia coli* Sigma 70 is Inessential for Initiation of Transcription at an Extended Minus 10 Promoter," *J. Mol. Biol.* 232:406-418 (1993).
- Laemmli, "Cleavage of Structural Proteins during the Assembly of the Head of Bacteriophage T4," *Nature* 227:680-685 (1970).
- Lessley et al., "Saline-Extracted Antigens of *Pasteurella Haemolytica*: Separation by Chromatofocusing, Preliminary Characterization, and Evaluation of Immunogenicity," *Vet. Immunol. Immunopathol.* 10:279-296 (1985).
- Levinson and Gutman, "Slipped-Strand Mismatching: A Major Mechanism for DNA Sequence Evolution," *Mol. Biol. Evol.* 4:203-221 (1987).
- Livrelli et al., "Sequence and Molecular Characterization of the ROB-1 .beta.-Lactamase Gene from *Pasteurella haemolytica*," *Antimicrob. Agents Chemother.* 35:242-251 (1991).
- Lo, "An analysis of the codon usage of *Pasteurella haemolytica* A1," *FEMS Microbiol. Lett.* 100:125-132 (1992).
- Lo et al., "Nucleotide Sequence of the *Leukotoxin* Genes of *Pasteurella haemolytica* A1," *Infect. Immun.* 55:1987-1996 (1989).
- Lukomski et al., "Identification of the O Antigen Polymerase (rfc) Gene in *Escherichia coli* O4 by Insertional Mutagenesis Using a Nonpolar Chloramphenicol Resistance Cassette," *J. Bacteriol.* 178:240-247 (1996).
- Maniatis et al., *Molecular Cloning: A Laboratory Manual*, Cold Spring Harbor Press, Cold Spring Harbor, New York (1982).
- Martin et al., "Factors Associated with Mortality in Feedlot Cattle: The Bruce County Beef Cattle Project," *Can. J. Comp. Med.* 44:1-10 (1980).
- McMillan, "Working Together, Sharing Knowledge," *Bovine Respiratory Disease: A Symposium*, R.W. Loan (ed.), p. 64 (1984).
- Miller, *Experiments in Molecular Genetics*, Cold Spring Harbor Laboratory, Cold Spring Harbor, NY (1972).
- Mullis et al., "Specific Enzymatic Amplification of DNA In Vitro: The Polymerase Chain Reaction," *Cold Spring Harbor Symposia*, vol. LI, pp. 263-273 (1986).
- Murphy et al., "Hemolytic Activity of the *Pasteurella haemolytica* *Leukotoxin*," *Infect. Immun.* 63:3209-3212 (1995).
- Neumann et al., "A Novel Rapid Assay for Chloramphenicol Acetyltransferase Gene Expression," *BioTechn.* 5:444-447 (1987).
- Nielsen et al., "Peptide nucleic acids (PNAs): Potential antisense and anti-gene agents," *Anticancer Drug Des.* 8:53-63 (1993).
- Oka et al., "Nucleotide Sequence of the Kanamycin Resistance Transposon Tn903," *J. Mol. Biol.* 147:217-226 (1981).
- Pearson, *Pyrogens: Endotoxins, LAL Testing and Depyrogenation*, Marcel Dekker, New York, pp. 150-158 (1985).
- Petrus et al., "Antigenic and Virulence Properties of *Pasteurella haemolytica* *Leukotoxin* Mutants," *Infect. Immun.* 63:1033-1039 (1995).
- Poyart-Salmeron, "The integration-excision system of the conjugative transposon Tn 1545 is structurally and functionally related to those of lambdaoid phages," *Mol. Microbiol.* 4:1513-1521 (1990).
- Sansonetti et al., "Involvement of a Plasmid in the Invasive Ability of *Shigella flexneri*," *Infect. Immun.* 35:852-860 (1982).
- Sharma and Schimke, "Preparations of Electro-Competent *E. coli* Using Salt-Free Growth Medium," *BioTechn.* 20:42-44 (1996).
- Shaw, "Chloramphenicol acetyltransferase from chloramphenicol-resistant bacteria," in *Methods in Enzymology*, J.H. Hushs (ed.), Academic Press, New York, pp. 737-775 (1982).
- Shewen and Wilkie, "Cytotoxin of *Pasteurella haemolytica* Acting on Bovine Leukocytes," *Infect. Immun.* 35:91-94 (1982).
- Shewen and Wilkie, "Vaccination of Calves with Leukotoxic Culture Supernatant from *Pasteurella haemolytica*," *Can. J. Vet. Res.* 52:30-36 (1988).
- Shewen and Wilkie, "Evidence for the *Pasteurella haemolytica* cytotoxin as a product of actively growing bacteria," *Amer. J. Vet. Res.* 46:1212-1214 (1985).
- Strathdee and Lo, "Cloning, Nucleotide Sequence, and Characterization of Genes Encoding the Secretion Function of the *Pasteurella haemolytica* *Leukotoxin* Determinant," *J. Bacteriol.* 171(2):916-928 (1989).
- Strathdee et al., "Extensive Homology between the *Leukotoxin* of *Pasteurella haemolytica* A1 and the Alpha-Hemolysin of *Escherichia coli*," *Infect. Immun.* 55:3233-3236 (1987).
- Tatum et al., "Molecular Gene Cloning and Nucleotide Sequencing and Construction

of an aroA Mutant of Pasteurella haemolytica Serotype A1," Appl Environ. Microbiol. 60:2011-2016 (1994).

Thomas, "Hybridization of denatured RNA and small DNA fragments transferred to nitrocellulose," Proc. Natl. Acad. Sci. 77:5201-5205 (1980).

Trieu-Cuot et al., "An integrative vector exploiting the transposition properties of the Tn1545 for insertional mutagenesis and cloning of genes from Gram-positive bacteria," Gene 106:21-27 (1991).

Wagner et al., "Active and Inactive Forms of Hemolysin (HlyA) from Escherichia coli," Mol. Microbiol. 369:39-46 (1988).

Waurzyniak et al., "Enhancement of Pasteurella haemolytica leukotoxic activity by bovine serum albumin," Amer. J. Vet. Res. 55:1267-1274 (1994).

Weisemann et al., "Measurement of In Vivo Expression of the recA Gene of Escherichia coli by Using lacZ Gene Fusions," J. Bacteriol. 160:112-121 (1984).

Welch, "Pore-forming cytolysins of Gram-negative bacteria," Mol. Microbiol. 5:521-528 (1991).

West et al., "Construction of an Actinobacillus pleuropneumoniae-Escherichia coli shuttle vectors: expression of antibiotic-resistance genes," Gene 160:81-86 (1995).

Wood and Lainson, "A native plasmid of Pasteurella haemolytica serotype A1:DNA sequence analysis and investigation of its potential as a vector," Res. Vet. Sci. 58:163-168 (1995).

Wright et al., "Characterization of a Pasteurella haemolytica Plasmid and Its Use to Express Recombinant Proteins in P. Multocida," Plasmid 37:65-79 (1997).

Yates, "A Review of Infectious Bovine Rhinotracheitis, Shipping Fever Pneumonia and Viral-Bacterial Synergism in Respiratory Disease of Cattle," Can. J. Comp. Med. 46:225-263 (1982).

Berrier, Animal Sanitation and Disease Prevention, Second Edition, Kendall/Hunt Publishing Company, Dubuque, Iowa, pp. 192, 210 (1977).

Chang et al., "Pneumonic pasteurellosis: Examination of typable and untypable Pasteurella haemolytica strains for leukotoxin production, plasmid content, and antimicrobial susceptibility," Am. J. Vet. Res. 48(3):378-384 (1987).

Chidambaram et al., "Isolation of Pasteurella haemolytica Leukotoxin Mutants," Infection and Immunity 63(3):1027-1032 (1995).

Collins, "Pasteurella, Yersinia, and Francisella," Medical Microbiology, Fourth Edition, (ed. Baron), The University of Texas Medical Branch at Galveston, TX, pp. 381-386.

Hackett et al., J. Biol. Chem. 270(35):20250-20253 (1995).

Holmes et al., "Unusual Gram-Negative Bacteria, Including Capnocytophaga, Eikenella, Pasteurella, and Streptobacillus," Manual of Clinical Microbiology, Sixth Ed., (ed. Murray et al.), ASM Press, Washington, D.C., pp. 499-508 (1995).

Microbiology, Fourth Edition, (ed. Davis et al.), J.B. Lippincott Company, Philadelphia, pp. 609-610 (1990).

Murphy et al., "Restriction Endonuclease Analysis and Ribotyping Differentiate Pasteurella haemolytica Serotype A1 Isolates from Cattle within a Feedlot," J. Clin. Microbiol. 31(9):2303-2308 (1993).

"Pasteurella, Actinobacillus, Streptobacillus and Calymatobacterium," Zinsser Microbiology, Eighteenth Edition, Chapter 42, (ed. Joklik et al.), Appleton-Century-Crofts, Norwalk, Connecticut, pp. 657-659 (1984).

Schwarz et al., "Detection and Interspecies-Transformation of a .beta.-Lactamase-Encoding Plasmid from Pasteurella haemolytica," Zbl. Bakt. Hyg. A 270:462-469 (1989).

The Merck Veterinary Manual, Fifth Ed., (ed. Siegmund et al.), Merck & Co., Inc., Rahway, NJ, pp. 910-913 (1979).

Fedorova and Highlander, "Plasmids for heterologous expression in Pasteurella haemolytica," Gene 186:207-211 (1997).

ART-UNIT: 165

PRIMARY-EXAMINER: Graser; Jennifer

ATTY-AGENT-FIRM: Medlen & Carroll, LLP

#### ABSTRACT:

The present invention is directed to compositions and methods for the production for the prevention of disease due to P. haemolytica. In particular, the present

invention provides *P. haemolytica* strains that produce inactive leukotoxin for vaccine and other uses. The present invention also provides compositions and methods for genetic manipulations in *P. haemolytica*.

16 Claims, 20 Drawing figures

**WEST**

Generate Collection

Search Results - Record(s) 1 through 10 of 64 returned.

☐ 1. Document ID: US 6316609 B1

L2: Entry 1 of 64

File: USPT

Nov 13, 2001

US-PAT-NO: 6316609

DOCUMENT-IDENTIFIER: US 6316609 B1

TITLE: Nucleotide sequence of Escherichia coli pathogenicity islands

DATE-ISSUED: November 13, 2001

## INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Dillon; Patrick J.	Gaithersburg	MD		
Choi; Gil H.	Rockville	MD		
Welch; Rodney A.	Madison	WI		

US-CL-CURRENT: 536/23.1; 435/252.3, 435/252.33, 435/320.1, 435/325, 536/24.3,  
536/24.32

Full	Title	Citation	Front	Review	Classification	Date	Reference	Claims	KWIC	Draw Desc	Image
------	-------	----------	-------	--------	----------------	------	-----------	--------	------	-----------	-------

☐ 2. Document ID: US 6303130 B1

L2: Entry 2 of 64

File: USPT

Oct 16, 2001

US-PAT-NO: 6303130

DOCUMENT-IDENTIFIER: US 6303130 B1

TITLE: Pasteurella haemolytica vaccine inactivated by ultraviolet light

DATE-ISSUED: October 16, 2001

## INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Purdy; Charles W.	Amarillo	TX		
Straus; David C.	Lubbock	TX		

US-CL-CURRENT: 424/255.1; 424/184.1

Full	Title	Citation	Front	Review	Classification	Date	Reference	Claims	KWIC	Draw Desc	Image
------	-------	----------	-------	--------	----------------	------	-----------	--------	------	-----------	-------

☐ 3. Document ID: US 6228983 B1

L2: Entry 3 of 64

File: USPT

May 8, 2001

US-PAT-NO: 6228983  
DOCUMENT-IDENTIFIER: US 6228983 B1

TITLE: Human respiratory syncytial virus peptides with antifusogenic and antiviral activities

DATE-ISSUED: May 8, 2001

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Barney; Shawn O'Lin	Cary	NC		
Lambert; Dennis Michael	Cary	NC		
Petteway; Stephen Robert	Cary	NC		

US-CL-CURRENT: 530/300; 424/186.1, 424/211.1, 530/324, 530/325, 530/326

Full	Title	Citation	Front	Review	Classification	Date	Reference	Claims	KWIC	Draw Desc	Image
------	-------	----------	-------	--------	----------------	------	-----------	--------	------	-----------	-------

---

☐ 4. Document ID: US 6187296 B1

L2: Entry 4 of 64

File: USPT

Feb 13, 2001

US-PAT-NO: 6187296  
DOCUMENT-IDENTIFIER: US 6187296 B1

TITLE: Lysine decarboxylase inhibitors for the prevention and treatment of periodontal disease

DATE-ISSUED: February 13, 2001

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Levine; Martin	Norman	OK		

US-CL-CURRENT: 424/54; 424/49

Full	Title	Citation	Front	Review	Classification	Date	Reference	KWIC	Draw Desc	Image
------	-------	----------	-------	--------	----------------	------	-----------	------	-----------	-------

---

☐ 5. Document ID: US 6180112 B1

L2: Entry 5 of 64

File: USPT

Jan 30, 2001



US-PAT-NO: 6180112  
DOCUMENT-IDENTIFIER: US 6180112 B1

TITLE: Pasteurella haemolytica vaccine

DATE-ISSUED: January 30, 2001

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Highlander; Sarah K.	Houston	TX		
Fedorova; Natalie D.	Houston	TX		

US-CL-CURRENT: 424/255.1; 424/200.1, 424/234.1, 424/235.1, 424/236.1, 435/252.3,  
435/69.1, 536/23.7, 536/24.1

Full	Title	Citation	Front	Review	Classification	Date	Reference
------	-------	----------	-------	--------	----------------	------	-----------

KIMC	Draw Desc	Image
------	-----------	-------

---

☐ 6. Document ID: US 6130250 A

L2: Entry 6 of 64

File: USPT

Oct 10, 2000

US-PAT-NO: 6130250  
DOCUMENT-IDENTIFIER: US 6130250 A

TITLE: Veterinary use of a pleuromutilin derivative

DATE-ISSUED: October 10, 2000

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Burch; David George Sidney	Berkshire			GBX
Ripley; Paul Howard	Tonbridge			GBX
Zeisl; Erich	Jenbach			ATX

US-CL-CURRENT: 514/550

Full	Title	Citation	Front	Review	Classification	Date	Reference	Claims	KIMC	Draw Desc	Image
------	-------	----------	-------	--------	----------------	------	-----------	--------	------	-----------	-------

---

☐ 7. Document ID: US 6103220 A

L2: Entry 7 of 64

File: USPT

Aug 15, 2000

US-PAT-NO: 6103220  
DOCUMENT-IDENTIFIER: US 6103220 A

TITLE: Lysine decarboxylase inhibitors for the prevention and treatment of periodontal disease

DATE-ISSUED: August 15, 2000

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Levine; Martin	Norman	OK	73072	

US-CL-CURRENT: 424/54; 424/49

Full	Title	Citation	Front	Review	Classification	Date	Reference
------	-------	----------	-------	--------	----------------	------	-----------

K00C	Draw Desc	Image
------	-----------	-------

☐ 8. Document ID: US 6096320 A

L2: Entry 8 of 64

File: USPT

Aug 1, 2000

US-PAT-NO: 6096320  
DOCUMENT-IDENTIFIER: US 6096320 A

TITLE: Vaccines with chimeric protein comprising gamma-interferon and leukotoxin derived from pasteurella haemolytica

DATE-ISSUED: August 1, 2000

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Potter; Andrew	Saskatoon			CAX
Campos; Manuel	Lincoln	NE		
Hughes; Huw P. A.	Saskatoon			CAX

US-CL-CURRENT: 424/255.1; 424/192.1, 424/193.1, 424/195.11, 424/85.1, 424/85.4, 424/85.5, 435/69.5, 435/69.7, 530/350, 530/351

Full	Title	Citation	Front	Review	Classification	Date	Reference
------	-------	----------	-------	--------	----------------	------	-----------

K00C	Draw Desc	Image
------	-----------	-------

☐ 9. Document ID: US 6086902 A

L2: Entry 9 of 64

File: USPT

Jul 11, 2000

US-PAT-NO: 6086902  
DOCUMENT-IDENTIFIER: US 6086902 A

TITLE: Recombinant bovine herpesvirus type 1 vaccines

DATE-ISSUED: July 11, 2000

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Zamb; Timothy	Setauket	NY		
Liang; Xiaoping	Saskatoon			CAX
Babiuk; Lorne A.	Saskatoon			CAX

US-CL-CURRENT: 424/209.1; 424/204.1, 424/205.1

Full	Title	Citation	Front	Review	Classification	Date	Reference
------	-------	----------	-------	--------	----------------	------	-----------

KWIC	Draw. Desc	Image
------	------------	-------

☐ 10. Document ID: US 6086896 A

L2: Entry 10 of 64

File: USPT

Jul 11, 2000

US-PAT-NO: 6086896  
DOCUMENT-IDENTIFIER: US 6086896 A

TITLE: Antigenic iron repressible protein from N. meningitidis related to the hemolysin family of toxins

DATE-ISSUED: July 11, 2000

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Sparling; P. Frederick	Moncure	NC		
Thompson; Stuart	Carrboro	NC		

US-CL-CURRENT: 424/250.1; 424/184.1, 424/185.1, 424/249.1, 435/7.1, 530/350

Full	Title	Citation	Front	Review	Classification	Date	Reference
------	-------	----------	-------	--------	----------------	------	-----------

KWIC	Draw. Desc	Image
------	------------	-------

Generate Collection

Terms	Documents
leukotoxin and pasteurella	64

Display

10

Documents, starting with Document:

11

Display Format:

CIT

Change Format

**WEST**[Generate Collection](#)**Search Results - Record(s) 11 through 20 of 64 returned.**☐ 11. Document ID: US 6037321 A

L2: Entry 11 of 64

File: USPT

Mar 14, 2000

US-PAT-NO: 6037321

DOCUMENT-IDENTIFIER: US 6037321 A

TITLE: Fusion proteins comprising vasoactive intestinal peptide or PACAP

DATE-ISSUED: March 14, 2000

## INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Cox; Graham J.M.	Saskatoon			CAX
Manns; Jack	Saskatoon			CAX
Weeks-Levy; Carolyn	Saskatoon			CAX

US-CL-CURRENT: 514/2; 435/252.3, 435/320.1, 435/325, 435/69.7, 514/12, 530/350,  
536/23.4[Full](#) [Title](#) [Citation](#) [Front](#) [Review](#) [Classification](#) [Date](#) [Reference](#)[KIMC](#) [Draw Desc](#) [Image](#)☐ 12. Document ID: US 6030625 A

L2: Entry 12 of 64

File: USPT

Feb 29, 2000

US-PAT-NO: 6030625

DOCUMENT-IDENTIFIER: US 6030625 A

TITLE: Bordetella pertussis and Bordetella parapertussis strains

DATE-ISSUED: February 29, 2000

## INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Gueirard; Pascale	Meudon la Foret			FRX
Guiso; Nicole	Paris			FRX

US-CL-CURRENT: 424/253.1; 424/184.1, 424/234.1, 424/240.1, 424/254.1, 424/93.1,  
424/93.4, 435/243, 435/252.1[Full](#) [Title](#) [Citation](#) [Front](#) [Review](#) [Classification](#) [Date](#) [Reference](#)[KIMC](#) [Draw Desc](#) [Image](#)☐ 13. Document ID: US 6022960 A

L2: Entry 13 of 64

File: USPT

Feb 8, 2000

US-PAT-NO: 6022960

DOCUMENT-IDENTIFIER: US 6022960 A

TITLE: GnRH-leukotoxin chimeras

DATE-ISSUED: February 8, 2000

## INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Potter; Andrew A.	Saskatoon			CAX
Manns; John G.	Saskatoon			CAX

US-CL-CURRENT: 536/23.1; 424/184.1, 424/235.1, 435/252.3, 435/320.1, 435/69.3,  
435/69.7, 536/23.4, 536/23.7

Full	Title	Citation	Front	Review	Classification	Date	Reference
------	-------	----------	-------	--------	----------------	------	-----------

K00C	Draw Desc	Image
------	-----------	-------

☐ 14. Document ID: US 6019984 A

L2: Entry 14 of 64

File: USPT

Feb 1, 2000

US-PAT-NO: 6019984

DOCUMENT-IDENTIFIER: US 6019984 A

TITLE: Bacterial preparations, method for producing same, and their use as vaccines

DATE-ISSUED: February 1, 2000

## INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
MacInnes; Janet	Guelph			CAX
Ricciatti; Paul	Guelph			CAX
Mallard; Bonnie	Ariss			CAX
Rosendal, deceased; Soren	late of Guelph			CAX

US-CL-CURRENT: 424/255.1; 424/184.1, 424/278.1, 424/823, 424/824, 424/825,  
424/826, 424/827, 424/828, 424/829, 424/93.2, 424/93.4, 424/93.48, 435/243

Full	Title	Citation	Front	Review	Classification	Date	Reference
------	-------	----------	-------	--------	----------------	------	-----------

K00C	Draw Desc	Image
------	-----------	-------

☐ 15. Document ID: US 6017536 A

L2: Entry 15 of 64

File: USPT

Jan 25, 2000

US-PAT-NO: 6017536  
DOCUMENT-IDENTIFIER: US 6017536 A

TITLE: Simian immunodeficiency virus peptides with antifusogenic and antiviral activities

DATE-ISSUED: January 25, 2000

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Barney; Shawn O'Lin	Cary	NC		
Lambert; Dennis Michael	Cary	NC		
Petteway; Stephen Robert	Cary	NC		
Langlois; Alphonse J.	Durham	NC		

US-CL-CURRENT: 424/188.1; 424/208.1, 530/300, 530/324, 530/325, 530/326

Full	Title	Citation	Front	Review	Classification	Date	Reference
------	-------	----------	-------	--------	----------------	------	-----------

KMC	Draw Desc	Image
-----	-----------	-------

---

☐ 16. Document ID: US 5993852 A

L2: Entry 16 of 64

File: USPT

Nov 30, 1999

US-PAT-NO: 5993852  
DOCUMENT-IDENTIFIER: US 5993852 A

TITLE: Biphasic lipid vesicle composition for transdermal administration of an immunogen

DATE-ISSUED: November 30, 1999

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Foldvari; Marianna	Saskatchewan			CAX
Baca-Estrada; Maria	Saskatchewan			CAX

US-CL-CURRENT: 424/450; 264/41, 264/43, 424/193.1, 424/196.11, 424/234.1,  
424/449, 424/812, 424/93.1, 436/829

Full	Title	Citation	Front	Review	Classification	Date	Reference
------	-------	----------	-------	--------	----------------	------	-----------

KMC	Draw Desc	Image
-----	-----------	-------

---

☐ 17. Document ID: US 5985289 A

L2: Entry 17 of 64

File: USPT

Nov 16, 1999

US-PAT-NO: 5985289  
DOCUMENT-IDENTIFIER: US 5985289 A

TITLE: Haemophilus somnus outer membrane protein extract enriched with  
iron-regulated proteins

DATE-ISSUED: November 16, 1999

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Potter; Andrew A.	Saskatoon			CAX
Harland; Richard J.	Saskatoon			CAX

US-CL-CURRENT: 424/256.1; 424/184.1, 424/193.1, 424/203.1, 424/236.1, 424/255.1,  
424/278.1, 424/282.1

Full	Title	Citation	Front	Review	Classification	Date	Reference
------	-------	----------	-------	--------	----------------	------	-----------

KIMC	Draw Desc	Image
------	-----------	-------

---

☐ 18. Document ID: US 5985286 A

L2: Entry 18 of 64

File: USPT

Nov 16, 1999

US-PAT-NO: 5985286  
DOCUMENT-IDENTIFIER: US 5985286 A

TITLE: Bordetella strains

DATE-ISSUED: November 16, 1999

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Gueirard; Pascale	Meudon la Foret			FRX
Guiso; Nicole	Paris			FRX

US-CL-CURRENT: 424/240.1; 424/253.1, 424/254.1, 424/255.1, 424/93.1, 424/93.4,  
435/183, 435/232, 435/243, 435/252.1, 435/71.2, 435/814

Full	Title	Citation	Front	Review	Classification	Date	Reference
------	-------	----------	-------	--------	----------------	------	-----------

KIMC	Draw Desc	Image
------	-----------	-------

---

☐ 19. Document ID: US 5969126 A

L2: Entry 19 of 64

File: USPT

Oct 19, 1999

US-PAT-NO: 5969126  
DOCUMENT-IDENTIFIER: US 5969126 A

TITLE: GNRH-leukotoxin chimeras

DATE-ISSUED: October 19, 1999

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Potter; Andrew A.	Saskatoon			CAX
Manns; John G.	Saskatoon			CAX

US-CL-CURRENT: 536/23.5; 435/252.31, 435/252.33, 435/254.21, 435/69.1, 435/69.3,  
435/69.7, 536/23.4, 536/23.7

Full	Title	Citation	Front	Review	Classification	Date	Reference
------	-------	----------	-------	--------	----------------	------	-----------

KIMC	Draw Desc	Image
------	-----------	-------

☐ 20. Document ID: US 5951988 A

L2: Entry 20 of 64

File: USPT

Sep 14, 1999

US-PAT-NO: 5951988  
DOCUMENT-IDENTIFIER: US 5951988 A

TITLE: Adjuvant formulation with enhanced immunogenic activity, and related compositions and methods

DATE-ISSUED: September 14, 1999

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Littel-van den Hurk; Sylvia van Drunen	Saskatoon			CAX
Zamb; Timothy	Setauket	NY		
Redmond; Mark J.	Saskatoon			CAX

US-CL-CURRENT: 424/278.1; 424/184.1, 424/204.1, 424/234.1, 424/283.1, 514/642

Full	Title	Citation	Front	Review	Classification	Date	Reference
------	-------	----------	-------	--------	----------------	------	-----------

KIMC	Draw Desc	Image
------	-----------	-------

Generate Collection

Terms	Documents
leukotoxin and pasteurella	64

Display

10

Documents, starting with Document:

21

Display Format:

CIT

Change Format



**WEST**☐ Generate Collection

L2: Entry 24 of 64

File: USPT

Feb 16, 1999

US-PAT-NO: 5871750

DOCUMENT-IDENTIFIER: US 5871750 A

TITLE: Leukotoxin vaccine compositions and uses thereof

DATE-ISSUED: February 16, 1999

## INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Potter; Andrew A.	Saskatoon			CAX

US-CL-CURRENT: 424/255.1; 424/184.1, 424/185.1, 424/236.1, 424/832, 435/69.1,  
435/69.3, 435/71.1, 530/350

## CLAIMS:

We claim:

1. A vaccine composition capable of eliciting an immunological response in a subject to which it is administered, said composition comprising:  
(a) an immunogenic Pasteurella haemolytica leukotoxin polypeptide, wherein said leukotoxin polypeptide has a truncation selected from the group consisting of an N-terminal truncation, a C-terminal truncation, and an N-terminal and a C-terminal truncation, and further wherein said leukotoxin polypeptide comprises the amino acid sequence encoded by the leukotoxin gene present in plasmid pAA342; and  
(b) a pharmaceutically acceptable vehicle.
2. The vaccine composition of claim 1, wherein said immunogenic leukotoxin is LKT 352 as depicted in FIGS. 5A-5F.
3. The vaccine composition of claim 1, wherein said immunogenic leukotoxin is the truncated leukotoxin encoded by clone pAA342.
4. The vaccine composition of claim 1, wherein said immunogenic leukotoxin is the truncated leukotoxin encoded by clone pAA101.
5. The vaccine composition of claim 1 wherein the composition further comprises a saline extract of *P. haemolytica*.
6. The vaccine composition of claim 1 further comprising an adjuvant.
7. The vaccine composition of claim 5 further comprising an adjuvant.
8. The vaccine composition of claim 2 further comprising an adjuvant.
9. The vaccine composition of claim 3 further comprising an adjuvant.
10. The vaccine composition of claim 4 further comprising an adjuvant.
11. A method of preventing or ameliorating respiratory disease in a ruminant subject, said method comprising administering an effective amount of a vaccine composition according to claim 1 to said ruminant subject.
12. A method for preventing or ameliorating respiratory disease in a ruminant subject, said method comprising administering an effective amount of a vaccine composition according to claim 5 to said ruminant subject.
13. A method of preventing or ameliorating respiratory disease in a ruminant subject, said method comprising administering an effective amount of a vaccine composition according to claim 6 to said ruminant subject.
14. A method of preventing or ameliorating respiratory disease in a ruminant subject, said method comprising administering an effective amount of a vaccine composition according to claim 7 to said ruminant subject.
15. A method of preventing or ameliorating respiratory disease in a ruminant subject, said method comprising administering an effective amount of a vaccine

composition according to claim 2 to said ruminant subject.

16. A method of preventing or ameliorating respiratory disease in a ruminant subject, said method comprising administering an effective amount of a vaccine composition according to claim 3 to said ruminant subject.

17. A method of preventing or ameliorating respiratory disease in a ruminant subject, said method comprising administering an effective amount of a vaccine composition according to claim 4 to said ruminant subject.

18. A method of preventing or ameliorating respiratory disease in a ruminant subject, said method comprising administering an effective amount of a vaccine composition according to claim 8 to said ruminant subject.

19. A method of preventing or ameliorating respiratory disease in a ruminant subject, said method comprising administering an effective amount of a vaccine composition according to claim 9 to said ruminant subject.

20. A method of preventing or ameliorating respiratory disease in a ruminant subject, said method comprising administering an effective amount of a vaccine composition according to claim 10 to said ruminant subject.

**WEST**☐ Generate Collection

L2: Entry 24 of 64

File: USPT

Feb 16, 1999

US-PAT-NO: 5871750

DOCUMENT-IDENTIFIER: US 5871750 A

TITLE: Leukotoxin vaccine compositions and uses thereof

DATE-ISSUED: February 16, 1999

## INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Potter; Andrew A.	Saskatoon			CAX

## ASSIGNEE-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY	TYPE CODE
University Saskatchewan	Saskatoon			CAX	03

APPL-NO: 8/ 355919

DATE FILED: December 14, 1994

## PARENT-CASE:

CROSS REFERENCE TO RELATED APPLICATION This application is a continuation of application Ser. No. 08/015,537 filed on 9 February 1993, now U.S. Pat. No. 5,476,657, which is a continuation of application Ser. No. 07/504,850 filed on 5 April 1990, abandoned, which is a continuation-in-part of application Ser. No. 07/335,018 filed on 7 April 1989, abandoned.

INT-CL: [6] A61K 39/02, A61K 39/102, C07K 14/285

US-CL-ISSUED: 424/255.1; 424/184.1, 424/185.1, 424/236.1, 424/832, 530/350, 435/69.1, 435/69.3, 435/71.1

US-CL-CURRENT: 424/255.1; 424/184.1, 424/185.1, 424/236.1, 424/832, 435/69.1, 435/69.3, 435/71.1, 530/350

FIELD-OF-SEARCH: 424/184.1, 424/185.1, 424/255.1, 424/236.1, 435/69.3, 435/69.1, 435/71.1, 435/83.2, 530/350

## PRIOR-ART-DISCLOSED:

## U.S. PATENT DOCUMENTS

Search Selected

Search ALL

PAT-NO	ISSUE-DATE	PATENTEE-NAME	US-CL
<input type="checkbox"/> 4957739	September 1990	Berget et al.	424/92
<input type="checkbox"/> 5028423	July 1991	Prickett	424/85.8
<input type="checkbox"/> 5055400	October 1991	Lo et al.	435/69.1
<input type="checkbox"/> 5165924	November 1992	Shewen et al.	424/88

## FOREIGN PATENT DOCUMENTS

FOREIGN-PAT-NO  
WO 91/15237

PUBN-DATE  
October 1991

COUNTRY  
WOX

US-CL

#### OTHER PUBLICATIONS

Gruz et al Mol. Microbiol 4:1933-1940, 1990.  
Lally et al J. Dent Res. 68:A913, 1984 Abstract Only.  
Shewent et al (1) Vet Med 1078-1083, 1988.  
Shewen et al (2) Can J. Res. 30-36, 1988.  
Durham et al, Am J. Vet Res 47: 1946-1951 1986.  
Biostar Brochure, entitled "3 New Vaccines", released on 6 Jul. 1991.  
Baluyut et al., "Interaction of Pasteurella haemolytica with Bovine Neutrophils: Identification and Partial Characterization of a Cytotoxin" Am. J. Vet. Res. (1981) 42:1920-1926.  
Cavaliere et al., "Escherichia coli .alpha.-hemolysin: Characteristics and probable role in pathogenicity" Microbiol. Reviews (1984) 48:326-343.  
Conlon et al., "Efficacy of Recombinant Leukotoxin in Protection Against Pneumonic Challenge with Live Pasteurella haemolytica A1" Infect. Immun. (1991) 59:587-591.  
Frey et al., "Actinobacillus pleuropneumoniae RTX-toxins: uniform designation of haemolysins, cytolysins, pleurotoxin and their genes" J. Gen. Microbiol. (1993) 139:1723-1728.  
Gentry et al., "Serum Neutralization of Cytotoxin from Pasteurella haemolytica, Serotype 1 and Resistance to Experimental Bovine Pneumonic Pasteurellosis" Vet. Immunology and Immunopathology (1985) 9:239-250.  
Himmel et al., "Purification and Partial Characterization of a Macrophage Cytotoxin from Pasteurella haemolytica" Am. J. Vet. Res. (1982) 43:764-767.  
Lo et al., "Cloning and Expression of the Leukotoxin Gene of Pasteurella haemolytica A1 in Escherichia coli K-12" Infect. Immun. (1985) 50:667-67.  
Lo et al., "Nucleotide Sequence of the Leukotoxin Genes of Pasteurella haemolytica A1" Infect. Immun. (1987) 55:1987-1996.  
Shewen, P.E. and Wilkie, B.N., "Cytotoxin of Pasteurella haemolytica Acting on Bovine Leukocytes" Infect. Immun. (1982) 35:91-94.  
Shewen, P.E. and Wilkie, B.N. "Pasteurella haemolytica Cytotoxin: Production by Recognized Serotype and Neutralization by Type-Specific Rabbit Antisera" Am. J. Vet. Res. (1983) 44:715-719.  
Shewen, P.E. and Wilkie, B.N., "Vaccination of Calves with Leukotoxic Culture Supernatant from Pasteurella haemolytica" Can. J. Vet. Res. (1988) 52:30-36.  
Simpson et al., "Killing of human myelomonocytic leukemia and lymphocytic cell lines by Actinobacillus actinomycetemcomitans leukotoxin" Infect. Immun. (1988) 56:1162-1166.  
Strathdee, C.A. and Lo, R.Y.C., "Extensive Homology between the Leukotoxin of Pasteurella haemolytica A1 and the Alpha-Hemolysin of Escherichia coli" Infect. Immun. (1987) 55:3233-3236.  
Sutherland et al., "A Crude Cytotoxin Vaccine Protects Sheep Against Experimental Pasteurella haemolytica Serotype A2 Infection" Vet. Microbiol. (1989) 19:175-181.  
Taichman et al., "Cytopathic effects of Actinobacillus actinomycetemcomitans on monkey blood leukocytes" J. Peridon. Res. (1984) 19:133-145.  
Welch, R.A., "Pore-forming cytolysins of Gram-negative bacteria" Mol. Microbiol. (1991) 5:521-528.  
Yates, W.D.G. "A Review of Infectious Bovine Rhinotracheitis, Shipping Fever Pneumonia and Viral-Bacterial Synergism in Respiratory Disease of Cattle" Can. J. Comp. Med. (1982) 46:225-263.

ART-UNIT: 182

PRIMARY-EXAMINER: Sidberry; Hazel F.

ATTY-AGENT-FIRM: Robins & Associates

#### ABSTRACT:

New proteins and subunit antigens from P. haemolytica for use in stimulating immunity against respiratory diseases such as pneumonia, including shipping fever pneumonia, are disclosed. The subunit antigens include immunogenic amino

acid sequences of *P. haemolytica* fimbrial protein, *P. haemolytica* plasmin receptor protein, and *P. haemolytica* 50K outer membrane protein and *P. haemolytica* leukotoxin. The antigens can be used in a vaccine composition, either alone or in combination. Also disclosed are methods of vaccination as well as methods of making the subunit antigens employed in the vaccines.

20 Claims, 21 Drawing figures

**WEST**

Generate Collection

Search Results - Record(s) 21 through 30 of 64 returned.

☐ 21. Document ID: US 5932705 A

L2: Entry 21 of 64

File: USPT

Aug 3, 1999

US-PAT-NO: 5932705

DOCUMENT-IDENTIFIER: US 5932705 A

TITLE: Methods and compositions for the treatment and diagnosis of shipping fever

DATE-ISSUED: August 3, 1999

## INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Berget; Peter	Pittsburgh	PA		
Engler; Michael	Houston	TX		
Highlander; Sarah	Houston	TX		
Weinstock; George	Houston	TX		

US-CL-CURRENT: 530/413; 424/190.1, 424/255.1, 435/69.1, 435/69.3, 435/71.1, 435/71.2, 530/344, 530/350, 530/387.9, 530/388.4, 530/389.5

Full	Title	Citation	Front	Review	Classification	Date	Reference
------	-------	----------	-------	--------	----------------	------	-----------

KMOC	Draw Desc	Image
------	-----------	-------

☐ 22. Document ID: US 5876725 A

L2: Entry 22 of 64

File: USPT

Mar 2, 1999

US-PAT-NO: 5876725

DOCUMENT-IDENTIFIER: US 5876725 A

TITLE: Actinobacillus pleuropneumoniae transferrin binding protein vaccines and uses thereof

DATE-ISSUED: March 2, 1999

## INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Potter; Andrew A.	Saskatoon			CAX
Gerlach; Gerald F.	Saskatoon			CAX
Willson; Philip J.	Saskatoon			CAX
Rossi-Campos; Amalia	Saskatoon			CAX

US-CL-CURRENT: 424/190.1; 424/234.1, 424/256.1

Full	Title	Citation	Front	Review	Classification	Date	Reference
------	-------	----------	-------	--------	----------------	------	-----------

KMOC	Draw Desc	Image
------	-----------	-------

☐ 23. Document ID: US 5874279 A

L2: Entry 23 of 64

File: USPT

Feb 23, 1999

US-PAT-NO: 5874279

DOCUMENT-IDENTIFIER: US 5874279 A

TITLE: Recombinant infectious bovine rhinotracheitis virus

DATE-ISSUED: February 23, 1999

## INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Cochran; Mark D.	Carlsbad	CA		
Macdonald; Richard D.	San Diego	CA		

US-CL-CURRENT: 435/235.1; 435/320.1

Full	Title	Citation	Front	Review	Classification	Date	Reference
------	-------	----------	-------	--------	----------------	------	-----------

KWIC	Draw Desc	Image
------	-----------	-------

☐ 24. Document ID: US 5871750 A

L2: Entry 24 of 64

File: USPT

Feb 16, 1999

US-PAT-NO: 5871750

DOCUMENT-IDENTIFIER: US 5871750 A

TITLE: Leukotoxin vaccine compositions and uses thereof

DATE-ISSUED: February 16, 1999

## INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Potter; Andrew A.	Saskatoon			CAX

US-CL-CURRENT: 424/255.1; 424/184.1, 424/185.1, 424/236.1, 424/832, 435/69.1, 435/69.3, 435/71.1, 530/350

Full	Title	Citation	Front	Review	Classification	Date	Reference	Claims	KWIC	Draw Desc	Image
------	-------	----------	-------	--------	----------------	------	-----------	--------	------	-----------	-------

☐ 25. Document ID: US 5861255 A

L2: Entry 25 of 64

File: USPT

Jan 19, 1999

US-PAT-NO: 5861255  
DOCUMENT-IDENTIFIER: US 5861255 A

TITLE: Composition and methods for diagnosis of diseases associated with  
Actinobacillus actinomycetemcomitans infection

DATE-ISSUED: January 19, 1999

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
DeMuth; Donald R.	Drexel Hill	PA		
Lally; Edward T.	West Chester	PA		

US-CL-CURRENT: 435/6; 435/91.2, 536/23.7, 536/24.1, 536/24.32, 536/24.33

Full	Title	Citation	Front	Review	Classification	Date	Reference
------	-------	----------	-------	--------	----------------	------	-----------

KWIC	Draw Desc	Image
------	-----------	-------

---

☐ 26. Document ID: US 5855894 A

L2: Entry 26 of 64

File: USPT

Jan 5, 1999

US-PAT-NO: 5855894  
DOCUMENT-IDENTIFIER: US 5855894 A

TITLE: Pasteurella haemolytica type A-1 bacterin-toxoid vaccine

DATE-ISSUED: January 5, 1999

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Brown; Albert L.	Lincoln	NE		
Dayalu; Krishnaswamy Iyengar	Lincoln	NE		
Kaufman; Thomas James	Lincoln	NE		
Newsham; Rex Steven	Lincoln	NE		

US-CL-CURRENT: 424/236.1; 424/184.1, 424/243.1, 424/252.1, 424/255.1, 424/278.1,  
424/823, 435/235.1, 530/350

Full	Title	Citation	Front	Review	Classification	Date	Reference
------	-------	----------	-------	--------	----------------	------	-----------

KWIC	Draw Desc	Image
------	-----------	-------

---

☐ 27. Document ID: US 5854034 A

L2: Entry 27 of 64

File: USPT

Dec 29, 1998



US-PAT-NO: 5854034  
DOCUMENT-IDENTIFIER: US 5854034 A

TITLE: DNA segments and methods for increasing polysaccharide production

DATE-ISSUED: December 29, 1998

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Pollock; Thomas J.	San Diego	CA		
Yamazaki; Motohide	San Diego	CA		
Thorne; Linda	Palomar	CA		
Mikolajczak; Marcia	Encinitas	CA		
Armentrout; Richard W.	La Jolla	CA		

US-CL-CURRENT: 435/101, 435/104, 435/252.3, 435/72, 536/23.2

Full	Title	Citation	Front	Review	Classification	Date	Reference
------	-------	----------	-------	--------	----------------	------	-----------

KNOW	Draw Desc	Image
------	-----------	-------

---

☐ 28. Document ID: US 5849531 A

L2: Entry 28 of 64

File: USPT

Dec 15, 1998

US-PAT-NO: 5849531  
DOCUMENT-IDENTIFIER: US 5849531 A

TITLE: Compositions and treatments for pneumonia in animals

DATE-ISSUED: December 15, 1998

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Potter; Andrew A.	Saskatoon			CAX

US-CL-CURRENT: 435/69.3, 424/200.1, 424/235.1, 424/236.1, 424/255.1, 435/320.1,  
435/69.1, 435/71.1, 530/350, 536/23.1, 536/23.7

Full	Title	Citation	Front	Review	Classification	Date	Reference
------	-------	----------	-------	--------	----------------	------	-----------

KNOW	Draw Desc	Image
------	-----------	-------

---

☐ 29. Document ID: US 5849305 A

L2: Entry 29 of 64

File: USPT

Dec 15, 1998

US-PAT-NO: 5849305

DOCUMENT-IDENTIFIER: US 5849305 A

TITLE: Construction of Pasteurella haemolytica vaccines

DATE-ISSUED: December 15, 1998

## INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Briggs; Robert E.	Boone	IA		
Tatum; Fred M.	Ames	IA		

US-CL-CURRENT: 424/255.1; 424/184.1, 424/93.2

Full	Title	Citation	Front	Review	Classification	Date	Reference	Claims	KWIC	Draw Desc	Image
------	-------	----------	-------	--------	----------------	------	-----------	--------	------	-----------	-------

☐ 30. Document ID: US 5837268 A

L2: Entry 30 of 64

File: USPT

Nov 17, 1998

US-PAT-NO: 5837268

DOCUMENT-IDENTIFIER: US 5837268 A

TITLE: GnRH-leukotoxin chimeras

DATE-ISSUED: November 17, 1998

## INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Potter; Andrew A.	Saskatoon			CAX
Manns; John G.	Saskatoon			CAX

US-CL-CURRENT: 424/255.1; 424/184.1, 424/192.1, 424/193.1, 424/198.1, 424/200.1,  
514/12, 514/15, 514/2, 514/7, 530/300, 530/350

Full	Title	Citation	Front	Review	Classification	Date	Reference	KWIC	Draw Desc	Image
------	-------	----------	-------	--------	----------------	------	-----------	------	-----------	-------

[Generate Collection](#)

Terms	Documents
leukotoxin and pasteurella	64

[Display](#)[10](#)

Documents, starting with Document:

[31](#)**Display Format:**[CIT](#)[Change Format](#)

**WEST**

Generate Collection

Search Results - Record(s) 31 through 40 of 64 returned.

☐ 31. Document ID: US 5824525 A

L2: Entry 31 of 64

File: USPT

Oct 20, 1998

US-PAT-NO: 5824525

DOCUMENT-IDENTIFIER: US 5824525 A

TITLE: Construction of Pasteurella haemolytica vaccines

DATE-ISSUED: October 20, 1998

## INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Briggs; Robert E.	Boone	IA		
Tatum; Fred M.	Ames	IA		

US-CL-CURRENT: 435/6; 435/252.1, 435/252.3, 435/441, 435/476

Full	Title	Citation	Front	Review	Classification	Date	Reference
------	-------	----------	-------	--------	----------------	------	-----------

KIMC	Draw Desc	Image
------	-----------	-------

☐ 32. Document ID: US 5804190 A

L2: Entry 32 of 64

File: USPT

Sep 8, 1998

US-PAT-NO: 5804190

DOCUMENT-IDENTIFIER: US 5804190 A

TITLE: Recombinant vaccine for porcine pleuropneumonia

DATE-ISSUED: September 8, 1998

## INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Struck; Douglas K.	College Station	TX		
Young; Ryland F.	College Station	TX		
Chang; Yung-Fu	Ithaca	NY		

US-CL-CURRENT: 424/190.1; 424/256.1, 530/350, 930/200

Full	Title	Citation	Front	Review	Classification	Date	Reference
------	-------	----------	-------	--------	----------------	------	-----------

KIMC	Draw Desc	Image
------	-----------	-------

☐ 33. Document ID: US 5801018 A

L2: Entry 33 of 64

File: USPT

Sep 1, 1998

US-PAT-NO: 5801018

DOCUMENT-IDENTIFIER: US 5801018 A

TITLE: Vaccines for Actinobacillus pleuropneumoniae

DATE-ISSUED: September 1, 1998

## INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Potter; Andrew A.	Saskatoon			CAX
Gerlach; Gerald F.	Saskatoon			CAX
Willson; Philip J.	Saskatoon			CAX
Rossi-Campos; Amalia	Saskatoon			CAX

US-CL-CURRENT: 435/69.3; 435/252.3, 435/252.33, 435/320.1, 536/23.7

Full	Title	Citation	Front	Review	Classification	Date	Reference
------	-------	----------	-------	--------	----------------	------	-----------

KMIC	Draw Desc	Image
------	-----------	-------

☐ 34. Document ID: US 5783195 A

L2: Entry 34 of 64

File: USPT

Jul 21, 1998

US-PAT-NO: 5783195

DOCUMENT-IDENTIFIER: US 5783195 A

TITLE: Recombinant infectious bovine rhinotracheitis virus S-IBR-052 and uses thereof

DATE-ISSUED: July 21, 1998

## INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Cochran; Mark D.	Carlsbad	CA		
Macdonald; Richard D.	San Diego	CA		

US-CL-CURRENT: 424/229.1; 435/235.1, 435/236

Full	Title	Citation	Front	Review	Classification	Date	Reference
------	-------	----------	-------	--------	----------------	------	-----------

KMIC	Draw Desc	Image
------	-----------	-------

☐ 35. Document ID: US 5766607 A

L2: Entry 35 of 64

File: USPT

Jun 16, 1998

US-PAT-NO: 5766607

DOCUMENT-IDENTIFIER: US 5766607 A

TITLE: Method of culturing M. bovis in low available iron media and isolation of outer membrane proteins

DATE-ISSUED: June 16, 1998

## INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Fenwick; Bradley W.	Manhattan	KS		
Rider; Maureen A.	Westmoreland	KS		
Brightman, II; Alan H.	Manhattan	KS		

US-CL-CURRENT: 424/251.1; 424/184.1, 424/234.1, 424/266.1, 435/69.3, 435/7.32, 435/70.1

Full	Title	Citation	Front	Review	Classification	Date	Reference
------	-------	----------	-------	--------	----------------	------	-----------

KUMC	Draw Desc	Image
------	-----------	-------

☐ 36. Document ID: US 5733780 A

L2: Entry 36 of 64

File: USPT

Mar 31, 1998

US-PAT-NO: 5733780

DOCUMENT-IDENTIFIER: US 5733780 A

TITLE: Construction of Pasteurella haemolytica vaccines

DATE-ISSUED: March 31, 1998

## INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Briggs; Robert E.	Boone	IA		
Tatum; Fred M.	Ames	IA		

US-CL-CURRENT: 435/320.1

Full	Title	Citation	Front	Review	Classification	Date	Reference
------	-------	----------	-------	--------	----------------	------	-----------

KUMC	Draw Desc	Image
------	-----------	-------

☐ 37. Document ID: US 5726016 A

L2: Entry 37 of 64

File: USPT

Mar 10, 1998

US-PAT-NO: 5726016  
DOCUMENT-IDENTIFIER: US 5726016 A

TITLE: Compositions and methods for diagnosis of diseases associated with  
actinobacillus actinomycetemcomitans infection

DATE-ISSUED: March 10, 1998

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
DeMuth; Donald R.	Drexel Hill	PA		
Lally; Edward T.	West Chester	PA		

US-CL-CURRENT: 435/6; 435/810, 435/91.2, 536/23.7, 536/24.32, 536/24.33

Full	Title	Citation	Front	Review	Classification	Date	Reference	Claims	KWIC	Draw Desc	Image
------	-------	----------	-------	--------	----------------	------	-----------	--------	------	-----------	-------

---

☐ 38. Document ID: US 5723129 A

L2: Entry 38 of 64

File: USPT

Mar 3, 1998

US-PAT-NO: 5723129  
DOCUMENT-IDENTIFIER: US 5723129 A

TITLE: GnRH-leukotoxin chimeras

DATE-ISSUED: March 3, 1998

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Potter; Andrew A.	Saskatoon			CAX
Manns; John G.	Saskatoon			CAX

US-CL-CURRENT: 424/200.1; 424/184.1, 424/192.1, 424/193.1, 424/198.1, 424/255.1,  
514/12, 514/15, 514/2, 514/7, 530/300

Full	Title	Citation	Front	Review	Classification	Date	Reference	KWIC	Draw Desc	Image
------	-------	----------	-------	--------	----------------	------	-----------	------	-----------	-------

---

☐ 39. Document ID: US 5708155 A

L2: Entry 39 of 64

File: USPT

Jan 13, 1998

US-PAT-NO: 5708155

DOCUMENT-IDENTIFIER: US 5708155 A

TITLE: Enhanced immunogenicity using leukotoxin chimeras

DATE-ISSUED: January 13, 1998

## INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Potter; Andrew A.	Saskatoon			CAX
Redmond; Mark J.	Saskatoon			CAX
Hughes; Huw P. A.	Saskatoon			CAX

US-CL-CURRENT: 536/23.4; 424/235.1, 435/69.1, 435/69.3, 435/69.7, 536/23.7

Full	Title	Citation	Front	Review	Classification	Date	Reference
------	-------	----------	-------	--------	----------------	------	-----------

KWIC	Draw Desc	Image
------	-----------	-------

☐ 40. Document ID: US 5693777 A

L2: Entry 40 of 64

File: USPT

Dec 2, 1997

US-PAT-NO: 5693777

DOCUMENT-IDENTIFIER: US 5693777 A

TITLE: DNA encoding pasteurella haemolytica PhaI restriction endonuclease and methyltransferase

DATE-ISSUED: December 2, 1997

## INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Briggs; Robert E.	Boone	IA		
Tatum; Fred M.	Ames	IA		

US-CL-CURRENT: 536/23.2; 435/196, 536/23.7

Full	Title	Citation	Front	Review	Classification	Date	Reference
------	-------	----------	-------	--------	----------------	------	-----------

KWIC	Draw Desc	Image
------	-----------	-------

[Generate Collection](#)

Terms	Documents
leukotoxin and pasteurella	64

[Display](#)[10](#)

Documents, starting with Document:

[41](#)**Display Format:**[CIT](#)[Change Format](#)

**WEST**

Generate Collection

L2: Entry 50 of 64

File: USPT

Dec 19, 1995

US-PAT-NO: 5476657

DOCUMENT-IDENTIFIER: US 5476657 A

TITLE: Pasteurella haemolytica leukotoxin compositions and uses thereof

DATE-ISSUED: December 19, 1995

## INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Potter; Andrew A.	Saskatoon			CAX

US-CL-CURRENT: 424/184.1; 424/185.1, 424/255.1, 424/282.1, 435/69.1, 530/350,  
530/388.7

## CLAIMS:

## I claim:

1. A vaccine composition comprising P. haemolytica leukotoxin 352 (LKT 352), as depicted in FIG. 5 and a pharmaceutically acceptable vehicle.
2. The vaccine composition of claim 1 wherein the composition further comprises a saline extract of P. haemolytica.
3. The vaccine composition of claim 1 further comprising an adjuvant.
4. The vaccine composition of claim 2 further comprising an adjuvant.
5. A vaccine composition comprising a pharmaceutically acceptable vehicle, an adjuvant, P. haemolytica leukotoxin 352 (LKT 352), as depicted in FIG. 5, and a saline extract of P. haemolytica.
6. Isolated P. haemolytica leukotoxin 352 (LKT 352), having the amino acid sequence depicted in FIG. 5.
7. A method for preventing or ameliorating respiratory disease in a ruminant subject, said method comprising administering an amount of a vaccine composition according to claim 1 effective to produce an immunological response, to said ruminant subject.
8. A method for preventing or ameliorating respiratory disease in a ruminant subject, said method comprising administering an amount of a vaccine composition according to claim 4 effective to produce an immunological response, to said ruminant subject.



**WEST**[Generate Collection](#)**Search Results - Record(s) 61 through 64 of 64 returned.**☐ 61. Document ID: US 5165924 A

L2: Entry 61 of 64

File: USPT

Nov 24, 1992

US-PAT-NO: 5165924

DOCUMENT-IDENTIFIER: US 5165924 A

TITLE: Serum-free, cell-free vaccine effective against pneumonic pasteurellosis in cattle

DATE-ISSUED: November 24, 1992

## INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Shewen; Patricia E.	Ontario			CAX
Wilkie; Bruce N.	Ontario			CAX

US-CL-CURRENT: 424/236.1; 424/255.1, 424/823, 435/252.1, 435/71.3

<a href="#">Full</a>	<a href="#">Title</a>	<a href="#">Citation</a>	<a href="#">Front</a>	<a href="#">Review</a>	<a href="#">Classification</a>	<a href="#">Date</a>	<a href="#">Reference</a>
----------------------	-----------------------	--------------------------	-----------------------	------------------------	--------------------------------	----------------------	---------------------------

<a href="#">KWIC</a>	<a href="#">Draw Desc</a>	<a href="#">Image</a>
----------------------	---------------------------	-----------------------

☐ 62. Document ID: US 5055400 A

L2: Entry 62 of 64

File: USPT

Oct 8, 1991

US-PAT-NO: 5055400

DOCUMENT-IDENTIFIER: US 5055400 A

TITLE: Leukotoxin gene of pasteurella haemolytica

DATE-ISSUED: October 8, 1991

## INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Lo; Reggie Y. C.	Guelph			CAX
Shewen; Patricia E.	Guelph			CAX
Strathdee; Craig A.	Mississauga			CAX

US-CL-CURRENT: 435/69.1; 435/235.1, 435/252.33, 435/320.1, 435/480, 435/91.41, 536/23.7

<a href="#">Full</a>	<a href="#">Title</a>	<a href="#">Citation</a>	<a href="#">Front</a>	<a href="#">Review</a>	<a href="#">Classification</a>	<a href="#">Date</a>	<a href="#">Reference</a>
----------------------	-----------------------	--------------------------	-----------------------	------------------------	--------------------------------	----------------------	---------------------------

<a href="#">KWIC</a>	<a href="#">Draw Desc</a>	<a href="#">Image</a>
----------------------	---------------------------	-----------------------

☐ 63. Document ID: US 5028423 A

L2: Entry 63 of 64

File: USPT

Jul 2, 1991

US-PAT-NO: 5028423

DOCUMENT-IDENTIFIER: US 5028423 A

TITLE: Immunogenic conjugates comprising leukotoxin peptide fragments

DATE-ISSUED: July 2, 1991

## INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Prickett; Kathryn S.	Seattle	WA		

US-CL-CURRENT: 424/190.1; 424/194.1, 424/197.11, 424/236.1, 424/255.1, 530/327,  
530/345, 530/350, 530/387.9, 530/389.5, 530/807

Full	Title	Citation	Front	Review	Classification	Date	Reference
------	-------	----------	-------	--------	----------------	------	-----------

KWIC	Draw Desc	Image
------	-----------	-------

☐ 64. Document ID: US 4957739 A

L2: Entry 64 of 64

File: USPT

Sep 18, 1990

US-PAT-NO: 4957739

DOCUMENT-IDENTIFIER: US 4957739 A

TITLE: Pharmaceutical compositions of a 105 kD P. Haemolytica derived antigen  
useful for treatment of Shipping Fever

DATE-ISSUED: September 18, 1990

## INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Berget; Peter	Pittsburg	PA		
Engler; Michael	Houston	TX		
Highlander; Sarah	Houston	TX		
Weinstock; George	Houston	TX		

US-CL-CURRENT: 424/190.1; 424/255.1, 435/71.2, 514/2, 514/21, 514/8, 530/350,  
530/387.9, 530/389.5, 530/395, 530/403, 530/825, 536/23.7, 930/200

Full	Title	Citation	Front	Review	Classification	Date	Reference
------	-------	----------	-------	--------	----------------	------	-----------

KWIC	Draw Desc	Image
------	-----------	-------

[Generate Collection](#)

Terms	Documents
leukotoxin and pasteurilla	64

[Display](#)[10](#)

Documents, starting with Document:

[64](#)

**Display Format:**